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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,524	01/06/2004	Yukihiro Sugiyama	65933-068	3298

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Washington, DC 20005-3096

EXAMINER
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LE, HOA T

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/751,524

Applicant(s)

SUGIYAMA ET AL.

Examiner

H. T. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 7-38 is/are pending in the application.
- 4a) Of the above claim(s) 17-38 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11,12,15 and 16 is/are allowed.
- 6) ☒ Claim(s) 1,2,7,8,13 and 14 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>June 2006</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Election/Restrictions***

2. This application contains claims 17-38 drawn to a nonelected election. The election has been considered without traverse for lack of adequate response as set forth in the last office action. See MPEP § 821.01.

#### ***Claim Rejections - 35 USC § 102***

3. Claims 1, 2, 7, 8, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by the Smalley publication (US 2002/0068170) as set forth in the last office action and further discussed below.

3.1 Applicant argues that the Smalley publication does not suggest “a structure in which a bonding material bonds the polymer wrapping the first structure to the second structure as in claim 1, or a structure wherein a bonding material bonds the polymer wound around the first structure to the second structure as in claim 2.”

Claim 30 of the Smalley publication recites “a first polymer molecule that coats a first single-wall carbon nanotube of the plurality of single-wall carbon nanotubes is cross-linked with a second polymer molecule that coats a second single-wall carbon nanotube of the plurality of single-wall carbon nanotubes.” (emphasis added). The claim clearly sets forth bonding of the first structure of the second structure by crosslinking, and the bonding material is the crosslinking bond.

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3.2 With regard to claims 7 and 8, the molecules with a specific interaction are the molecules that form the crosslinking bonds between the two polymers.

3.3 With regard to claims 13 and 14, applicant argues, “Claims 13 and 14 specify that the second structure is a base material. In contrast, ... Smalley merely indicate a structure in which carbon nanotubes are bonded with each other. ... Smalley neither disclose nor suggest a structure in which the first structure (carbon nanotube structure) is bonded with a base material.” (emphasis added). Claims 13 and 14 do not recite a “base material” but rather a “base member”. There’s a difference between the term “base material” and “base member”. “Base material” means a material that yields hydroxyl ions (OH<sup>-</sup>) in aqueous solution, while “base member”, in this case, is simply a nomenclature for the second structure because the specification does not specifically define “base member”. Therefore, when the second polymer that coats a second carbon nanotube is crosslinked with the first polymer molecule that coats a first carbon nanotube as recited in claim 30 of the Smalley publication, the second-polymer-coated nanotube constitutes a base member within the meaning of the claim language.

***Allowable Subject Matter***

4. Claims 11, 12, 15 and 16 are allowed over the prior art references of record.

5. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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6. The following is a statement of reasons for the indication of allowable subject matter:

6.1. Claims 9 and 10: The prior art reference, namely the Smalley publication, only suggests crosslinking reaction between synthetic polymers. Therefore, it is neither anticipatory nor obvious to form a bonding material that comprises a set of molecules which is a combination of ligand and receptor or of an antigen and an antibody.

6.2. Claims 11 and 12: It is neither anticipatory nor obvious to deviate from the teaching of synthetic thermoset polymers (crosslinkable material) as the coating material to select polypeptide, a natural biopolymer, as the coating material as required in instant claims 11 and 12.

6.3. Claims 15 and 16: Smalley suggests the use of coated nanotubes in electrically insulating matrix (par. [0017]). Thus, it is neither anticipatory nor obvious to deviate from an electrically insulating material as suggested by Smalley to a metal layer, which is an electrically conductive material.

### ***Conclusion***

7. Examiner's Note: The newly submitted reference WO 02/16257 is an equivalent prior art to the Smalley publication.

8. Applicant's arguments filed April 4, 2006 have been fully considered but they are not persuasive regarding the rejection to claims 1, 2, 7, 8, 13 and 14 as set forth in paragraphs 3.1 to 3.3 above.

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9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



H. T. Le  
Primary Examiner  
Art Unit 1773

July 9, 2006